

ABSTRACT OF THE DISCLOSURE

A prescription is provided which specifies constraints, e.g., the type (revolute and/or prismatic) and the number of joints which may be included between any two position-sensing elements (PSEs), where the joints connect the links of a kinematically constrained multi-articulated structure, whereby the defining parameters of the structure may be determined using the spatial placement of the two PSEs and the kinematic constraints of the multi-articulated structure, and where at least the spatial placement of one link is not directly measured. Also provided are preferred placements of PSEs and goniometers on a kinematically constrained multi-articulated structure which will allow determination of the spatial placement of the links, where at least the spatial placement of one link is not directly measured. Revolute joint models of the articulations of the entire human body, as well as preferred PSE and goniometer locations, are provided. An algorithm is provided for determining the joint angles for a finger modeled as a 4-link planar manipulator with one PSE affixed to the fingertip and one PSE affixed to the metacarpus.